Express Mail No. EU592640434US
Serial No. 09/803,829
Case Docket No. CHR 01-34

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#13
KW
5-23-03

Applicants: G. Frederick Hutter and Camille K. Stebbins

Serial No.: 09/803,829 Group Art Unit: 1774

Filed: March 12, 2001

For: Cationic Colloidal Dispersion Polymers for Ink Jet Coatings

Examiner: Tamra Dicus

Honorable Commissioner of
Patents and Trademarks
Washington, DC 20231

DECLARATION UNDER 37 C.F.R. §1.132

I, Thomas M. Sisson, declare as follows:

1. THAT I received my Ph. D. in Chemistry from the University of Arizona in 1997. Since 1997 I have performed research in industrial polymer chemistry, specifically emulsion polymerization at MeadWestvaco as well as SC Johnson Polymer in Racine Wisconsin. From 1997 to 2000, I was employed as a Research Scientist at SC Johnson Polymer, Racine Wisconsin. From 2000 to present, I have been employed with MeadWestvaco Corporation, Charleston, South Carolina, and currently hold the position of Technical Manager. I have more than 20 publications and patents in the field of polymer chemistry.

2. THAT I am familiar with the art and science of polymer chemistry and ink jet coatings.

3. THAT I am familiar with the above-described patent application and the teachings contained therein.

One skilled in the art would recognize that the reaction products which invariably result from the emulsion polymerization reaction of the reactants taught by the Applicants in the amounts taught by the Applicants are latexes. A skilled artisan would further understand that, due to the chemical characteristics and the amounts of the reactants employed by the Applicants in their emulsion polymerization process, the process taught and claimed by the Applicants would invariably produce emulsion polymerization products (i.e., latexes) which contain polymer particles having a size in the range of about 35 to about 200 nm.

The Applicants teach a process whereby the latexes resulting from the emulsion polymerization are adjusted to have a pH in the range of about 3.5 to about 7.0 to produce cationic acrylic colloidal dispersion polymer compositions. A skilled artisan would understand that the pH adjustment process taught and claimed by the Applicants' would invariably produce one-phase homogeneous colloidal dispersion products. That is, the emulsion polymerization products taught by the Applicants would, upon neutralization, produce a polymer that is molecularly dispersed in a single liquid phase.

4. THAT I am familiar with U.S. Patent No. 5,521,229 to Lu et al. and the teachings contained therein.

Lu teaches the photoinitiated polymerization of a microemulsion to produce a polymer composite having a bicontinuous structure. One skilled in the art would recognize that a microemulsion is composed of spherical droplets having a size of about 10 nm. When the microemulsion taught by Lu is subjected to the rapid photoinitiated polymerization taught by Lu, a solid product – a polymer composite – is produced which has two solid phases having domain sizes in the order of 10 nm. A skilled artisan would understand that the polymer composites taught by Lu are different products which have significantly different chemical properties that the colloidal dispersion polymer compositions taught by the Applicants. That is, a skilled artisan would recognize that there is a significant difference between a colloidal dispersion and a solid, and that the Applicants' colloidal dispersion polymer composition products are not the same as the solid polymer composite products taught by Lu.

5. THAT one skilled in the art would recognize that the "emulsion" taught and claimed by the Applicants would not encompass the term "microemulsion" taught and claimed by Lu.

A skilled artisan would understand that it is critical for a microemulsion to contain a certain level of surfactant, normally at least 30% by weight. The surfactant level taught by the Applicants ("from about 0.5% to about 8.0%, preferably from about 1.0% to about 5.0%, by weight of the total mixture employed to produce the emulsion polymer") is too low to form a microemulsion. That is, a microemulsion cannot be formed from an emulsion containing this level of surfactant. Indeed, one skilled in the art would recognize that that the Applicants do not teach, suggest, or even hint at the production of a microemulsion.

While Lu teaches a surfactant level in the range of "about 5% to about 70% by weight percent" of the microemulsion, a skilled artisan would understand that, at the lower levels of this stated surfactant range, a cosurfactant must be employed in order for the emulsion to contain the level of surfactant necessary to form a microemulsion. Lu teaches the use of such cosurfactants, which he refers to as "cosolvents".

6. THAT the properties of Lu's polymer composites (e.g., that they are substantially nonporous, water impermeable, and contain a hydrophobic phase) would clearly teach those skilled in the art away from any attempted use of these polymer composites as additives for water-based ink jet coatings.

The hydrophobic phase of Lu's polymer composite would render it unsuitable for use with water-based ink jet coatings, as the hydrophobic phase would repel the water-based ink, thereby resulting in ink mottle. This directly contrast with the one-phase homogeneous cationic acrylic colloidal dispersion polymer compositions taught by the Applicants, which are suitable for use with water-based ink jet coatings, as these polymers contain only a hydrophilic phase (not a hydrophobic one).

Also, the polymer composites taught by Lu are water impermeable. One skilled in the art would recognize that an ink jet receptive coating must be water permeable in order to be receptive to the ink.

The bulk properties of both hydrophilic and hydrophobic polymers contained in Lu's polymer composites are not required simultaneously in ink jet receptive coatings. Also, the slow release of either hydrophilic or hydrophobic materials from a polymer exhibited by Lu's polymer composites is not a desired characteristic in ink jet receptive coatings.

The mere fact that Lu's microemulsion can be coated on a substrate prior to its polymerization would not alter the physical characteristics of the polymer composite which makes the composite unsuitable for use as an ink jet receptive coating.

The teachings contained in Lu would perhaps fairly suggest to those skilled in the art the potential use of Lu's polymer composites in a BAND-AID like device or in a drug-delivery system such as a nicotine patch (where the possible "entrapment and slow release of either hydrophobic or hydrophilic materials" might be useful). However, the teachings contained in Lu would not lead one skilled in the art to attempt to utilize Lu's polymer composites in ink jet receptive coatings – these teachings would, in fact, clearly lead skilled artisans away from any such attempted use.

7. THAT one skilled in the art would recognize that Lu specifically teaches the use of photo initiators and that photoinitiation polymerization is critical to the formation of Lu's polymer composites. The photoinitiated polymerization serves to freeze the morphology of the microemulsion, thereby producing the substantially nonporous, bicontinuous structure of Lu's polymer composite.

A skilled artisan would understand that it would be impractical – if not impossible – to employ photo initiators in an emulsion polymerization to produce a latex. Emulsion polymerization is not compatible with photoinitiated polymerization, as it would be extremely difficult to get the needed photons into the inside of the micelles where the polymerization was occurring.

8. THAT I am familiar with U.S. Patent No. 5,372,884 to Abe et al. and the teachings contained therein.

Abe et al. teaches the use of colloidal silica that has been coated with a cation-modifer, preferably at least one hydrous metal oxide selected from the group consisting of hydrous aluminum oxide, hydrous zirconium oxide, and hydrous tin oxide. A skilled artisan would understand that Abe et al.'s compounds are pigment-like in nature. These compounds are significantly different from the ink jet receptive coatings taught by the Applicants.

9. THAT, for the reasons noted above, one skilled in the art would recognize that Lu does not teach, suggest, or even hint at the use of his polymeric composites in the formulation of ink jet receptive coatings.

10. THAT, for the reasons noted above, the teachings contained in Lu combined with the teachings contained in Abe would not teach or suggest to one skilled in the art the Applicants' process or the cationic acrylic colloidal dispersion polymer compositions produced by that process.

11. THAT the undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Thomas M. Sisson

Date: 5/12/03

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I, Gamini S. Samaranayake, declare as follows:

1. THAT I received my Ph. D. in Organic Chemistry from Virginia Polytechnic Institute in 1990. From 1990 - 1994, I performed post-graduate research in cellulose and polymeric chemistry at Virginia Polytechnic Institute, From 1994 – 1996, I was employed in chemical research at Insmed Pharmaceuticals. From 1996 to present, I have been employed with MeadWestvaco Corporation, Charleston, South Carolina, and currently hold the position of Research Chemist.

2. THAT I am familiar with the art and science of polymer chemistry and ink jet coatings.

3. THAT I am familiar with the above-described patent application and the teachings contained therein.

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Gamini S. Samaranayake

Date: May 12, 2003